

## REFERENCE WAFER AND PROCESS FOR MANUFACTURING SAME

### ABSTRACT

5        An apparatus and method for manufacturing and using a calibrated registration  
reference wafer in a semiconductor manufacturing facility. A reference reticle consisting of  
a 2-dimensional array of standard alignment attributes is exposed several times onto a  
photoresist coated semiconductor wafer using a photolithographic exposure tool. After the  
final steps of the lithographic development process the resist patterned wafer is physically  
10    etched using standard techniques to create a permanent record of the alignment attribute  
exposure pattern. The permanently recorded alignment attributes are measured for placement  
error using a conventional overlay metrology tool. The resulting overlay error data is used to  
generate a calibration file that contains the positions of the alignment attributes on the  
reference wafer. The reference wafer and calibration file can be used to determine the wafer  
15    stage registration performance for any photolithographic exposure tool.

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